

## PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-219674

(43)Date of publication of application : 27.08.1993

(51)Int.Cl.

H02K 3/50

H02K 5/22

(21)Application number : 04-022234

(71)Applicant : TOSHIBA CORP

(22)Date of filing : 07.02.1992

(72)Inventor : KINOSHITA TSUTOMU  
NAGAYAMA TAKASHI

## (54) MAIN MOTOR FOR VEHICLE

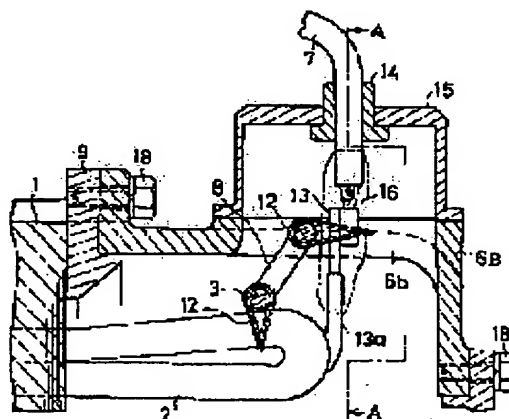
## (57)Abstract:

PURPOSE: To facilitate replacement of a bracket and to prevent damage to a lead at the time of replacing the bracket by fixing one side of a cleat to a stator coil axially protruding from a stator and fixing the other side of the cleat to a connector.

CONSTITUTION: Both ends of a cleat 8 made of a soft steel rod formed in an inverted U shape are previously welded to a bind ring 3 inserted to the outer periphery of a stator coil 2. Then, the cleat 8 is fixed to an upper end of the coil 2 by a glass tape 12 so disposed inside a cable connector 16 on a lower part of a suction hole 6b formed on a bracket 6B. An

upper part of the cleat 8 is fixed to a connector 16 by a glass tape 12. Thus, a bracket 6B can be solely

replaced without removing the cleat 8 from the bracket 6B, and a force to be applied to a lead plate 13 can be supported by the cleat 8. Accordingly, deformation of a base of the plate 13 and a crack of a cover 13a can be prevented.



BEST AVAILABLE COPY

## LEGAL STATUS

[Date of request for examination] 12.01.1998

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other

than the examiner's decision of rejection or  
application converted registration]

[Date of final disposal for application]

[Patent number] 3332402

[Date of registration] 26.07.2002

[Number of appeal against examiner's  
decision of rejection]

[Date of requesting appeal against  
examiner's decision of rejection]

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

**\* NOTICES \***

**JPO and NCIPi are not responsible for any damages caused by the use of this translation.**

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

**CLAIMS**

---

[Claim(s)]

[Claim 1] The main motor for cars characterized by for the cable connected to the bracket attached in the stator through a connection at said stator having penetrated, having fixed one side of said cleat to the stator coil which projected from said stator to shaft orientations in the main motor for cars with which the cleat which supports said connection was prepared in the interior of said bracket, and fixing a side besides said cleat to said connection.

[Claim 2] The main motor for cars according to claim 1 characterized by making a cleat into reinforced plastics material.

[Claim 3] The main motor for cars characterized by preparing the heights which fix said connection to said binding-head ring in the main motor for cars with which the binding-head ring which fixes both these stator coils to the stator coil which the cable connected to the bracket attached in the stator through a connection at said stator penetrated, and projected from said stator to shaft orientations was inserted.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

DETAILED DESCRIPTION

---

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the main motor for cars.

[0002]

[Description of the Prior Art] As everyone knows, on the railroad improvement in the speed of which is enhanced, lightweight-ization of a car is advanced for improvement in the speed, and lightweight-ization of the main motor for cars is demanded as part of that. In order to attain lightweight-ization of this main motor for cars, miniaturization of the iron core by the increment in a rotational frequency and improvement in cooling and a coil, modification of the configuration for the structured division, and modification of an ingredient, for example, adoption of aluminum material etc., are advanced.

[0003] The partial enlarged drawing of the right-hand side upper part of drawing 6 and drawing 8 of the sectional view in which drawing 6 shows an example of the conventional main motor for cars, and drawing 7 are the C-C sectional views of drawing 7. In drawing 6, drawing 7, and drawing 8, the truck which is not illustrated is supported by the dummy support 11 shown with the two-dot chain line fixed to the lower part of the car body which upper limit does not illustrate, and the iron core presser foot 9 and corrosion plate 10 of the pair which makes annular are welded to it with the side elevation which drawing 6 does not illustrate in the lower limit of dummy support 11, respectively.

[0004] Among these, the stator core 1 by which the laminating was carried out inside [ of a pair ] the iron core presser foot 9 is inserted beforehand, and is bound tight, and the top face is welded to the corrosion plate 10. Fitting of the binding-head ring 3 with which the glass tape was twisted further is carried out, after being annularly formed with the round bar of mild steel and twisting a PORIMIDO tape, a glass tape binds this binding-head ring 3 and the both ends of the stator coil 2 on the both-ends periphery of the stator coil 2 inserted in the slot of the inner circumference of a stator core 1, they are bound tight with a string 12, and vacuum impregnation of these binding-head rings 3 and the stator coil 2, and the stator core 1 is carried out to it with the epoxy resin.

[0005] With the sectional view of drawing 6, the periphery side face of bracket 6A made from an aluminum alloy casting which makes annular with the side elevation which this drawing 6 does not illustrate in an inverted-L character form is fixed to the left-hand side lateral surface of the iron core presser foot 9 with a bolt 18, and the periphery side face of bracket 6B made from an aluminum alloy casting which makes annular is being fixed to it with the bolt 18 in the side elevation which similarly is not illustrated to the right-hand side lateral surface of the iron core presser foot 9. Among these, annular bearing box 5A same with the through hole formed in the annular core is fixed to bracket 6A with a bolt, and annular bearing box 5B is being fixed to the through hole formed in the core same and annular to bracket 6B with the bolt. King bearing 19A is inserted in bearing box 5A from an outside, roller bearing 19B is inserted in bearing box 5B, respectively, a revolving shaft 4 is inserted in such king bearing 5A and roller bearing 5B, and the squirrel cage rotor 20 is being beforehand inserted and fixed by this revolving shaft 4.

[0006] On the other hand, lead-in hole 6b by which the cable 7 which supplies power is drawn in the stator coil 2 is formed in the upper limit of bracket 6B, and the cross-section inverted-L-shaped covering 15 is attached in the upper limit side of this lead-in hole 6b with the bolt 18, as drawing 8

shows. As the through hole which a cable 7 penetrates shows by drawing 8, it is prepared in the top face of this covering 15 by the three phase, and a cable 7 penetrates to these through holes, and this cable 7 is being fixed to covering 15 in the rough convex character-like rubber bush 14. A pressure connector is fixed to the core wire of this cable 7 by the lower limit of a cable 7, and this pressure connector is piled up and brazed on the side face of the upper limit of the interference plate 13 in which projected from the right end of the stator coil 2 to the upper part, and the base was covered with resin 13a. A glass tape is twisted, an insulating varnish is further applied to the periphery of the brazing section of these cables 7 and interference plates 13, and the cable splicing section 16 shown with a two-dot chain line is formed in the periphery of this glass tape at it.

[0007] With the top view which drawing 6 does not illustrate, the cleat 28 made from the mild steel round bar bent in the shape of a reverse KO character fixes both ends to shaft orientations with the ejection nut 17 from the upper limit outside of bracket 6B, and is prepared, an insulating varnish is applied to the upper limit section of bracket 6B, and this cleat 28 and the cable splicing section 16 are being mutually fixed to it, after a glass tape binds and being twisted with a string 12.

[0008] Thus, in the constituted main motor for cars, it is supporting the load of a rotator 20 through Brackets 6A and 6B by the stator core 1 supported by dummy support 11, and while using a stator core 1 also [ structural member ], lightweight-ization is attained by using Brackets 6A and 6B as an aluminium alloy. Output using the iron bracket currently used till then by lightweight-ization of these brackets 6A and 6B 300kW, weight In the 420kg main motor for cars, about 5% of lightweight-ization is attained.

[0009] On the other hand, when the car with which this main motor for cars was carried runs a track, the pebble of a track can wind up and it may be struck by Brackets 6A and 6B. And the rate of a car If it becomes [ o'clock ] in 200km /or more, it is afraid and the thing whose minute crack occurs with the pebble struck by Brackets 6A and 6B and to be is reported by the result of a driving test. Then, without decomposing the cable splicing section 16, as the bolt 18 which is fixing covering 15 is removed as a cleat 28 is indicated to be the nut 17 fixed to bracket 6B to drawing 9, and shown in drawing 9 in order to exchange bracket 6B then, from a cable 7, covering 15 and bracket 6B are drawn out up, as shown in arrow heads D and E, and new bracket 6B is inserted and exchanged.

[0010]

[Problem(s) to be Solved by the Invention] However, in the main motor for cars constituted in this way, as shown in drawing 10, when removing covering 15 with a bush 14, the cable 7 currently bent as drawing 8 showed is lengthened, or it moves by covering 15 or contact of bracket 6B, and the force is applied to the interference plate 13. Then, a check occurs in resin 13a covered by the base of this interference plate 13, and there is a possibility of carrying out the ground to bracket 6B through a cleat 28 with the moisture which dewed the front face by the temperature change by transit and a stop of a car. Furthermore, since a tight-binding activity with the cleat 28 and connection 16 by the glass tape which are performed after exchanging bracket 6B and fixing a cleat 28 must be done on lead-in hole 6b of bracket 6B by putting in a finger, it is hard to do it and it requires time amount.

[0011] Then, exchange of a bracket is easy for the purpose of the 1st, the 2nd, and the 3rd invention, and it is obtaining the main motor for cars which can prevent damage on the interference section at the time of bracket exchange.

[0012]

[Means for Solving the Problem] 1st invention is characterized by for the cable connected to the bracket attached in the stator through a connection at a stator having penetrated, having fixed one side of a cleat to the stator coil which projected from the stator to shaft orientations in the main motor for cars with which the cleat which supports a connection was prepared in the interior of a bracket, and fixing a side besides a cleat to a connection.

[0013] 2nd invention is characterized by for the cable connected to the bracket attached in the stator through a connection at a stator having penetrated, having fixed one side of the cleat of reinforced plastics material to the stator coil which projected from the stator to shaft orientations in the main motor for cars with which the cleat which supports a connection was prepared in the interior of a bracket, and fixing a side besides a cleat to a connection.

[0014] The cable connected to the bracket attached in the stator through a connection at a stator penetrates, and 3rd invention is characterized by preparing the heights which fix a connection to a

binding-head ring in the main motor for cars with which the binding-head ring which fixes both these stator coils to the stator coil which projected from the stator to shaft orientations was inserted. [0015]

[Function] A connection is fixed to the stator side before attachment of a bracket, and a bracket will be detached and attached, without participating in a connection.

[0016]

[Example] Hereafter, one example of the 1st and the main motor for cars of the 2nd invention is explained with reference to a drawing. However, the same sign is given to the same part as drawing 7, drawing 8 R> 8, and drawing 9, and explanation is omitted into it. The sectional view corresponding to drawing 8 of the former [ drawing 1 ] in the partial detail drawing of the main motor for cars of this invention and drawing 2 are the sectional views corresponding to the conventional drawing 9 same with the A-A sectional view of drawing 1, and the attaching position of a cleat 8 differs from the former.

[0017] In drawing 1 and drawing 2, to the binding-head ring 3 inserted in the periphery of the stator coil 2 As shown in drawing 2, in the lower part of lead-in hole 6b by which the both ends of the cleat 8 made from a mild steel rod formed in inverted-L-shaped were beforehand welded, and this cleat 8 was formed in the upper part of bracket 6B And as it is located inside the cable splicing section 16, it is fixed to the edge of the upper part of the stator coil 2 as usual with the glass tape 12. Moreover, the upper part of a cleat 8 is being fixed to the cable splicing section 16 with the glass tape 12 as usual.

[0018] Thus, in the constituted main motor for cars, bracket 6B can be exchanged independently, without removing a cleat 8 from bracket 6B like the cleat 28 shown by conventional drawing 8, when exchanging bracket 6B which the check generated with the struck pebble of a track. And since the force which can do the cable splicing section 16 in the condition of having been fixed by the cleat 8, and requires it for the interference plate 13 is supportable by the cleat 8, deformation of the base of the interference plate 13 can be prevented and generating of the check of covering 13a can be prevented.

[0019] Moreover, it is not necessary to decompose a cleat 8 and the cable splicing section 16, and since it stops needing varnish spreading as coil, rewinding [ of the glass tape 12 of the cable splicing section 16 at the time of exchange of bracket 6B and a cleat 8 by which varnish treated was carried out ], and the time amount which exchange of bracket 6B takes can be shortened. Furthermore, also in the time of the assembly in the works of the main motor for cars, since the tight-binding activity by the glass tape 12 of a connection 16 and a cleat 8 mentioned above can be performed before attaching bracket 6B, workability improves.

[0020] In addition, although the example welded to the binding-head ring 3 explained the cleat 8 in the 1st and 2nd invention, as shown in the binding-head ring 40 of drawing 4 in which the B-B sectional view of drawing 3 and drawing 3 is shown, it is made to project outside partially, the cable splicing section 16 is fixed directly, and it is good also as the 3rd invention. Furthermore, although the example manufactured with the mild steel rod explained the binding-head ring 3 and the cleat 8, they may be manufactured with insulating materials, such as FRP, for example. In this case, even if it increases a diameter and increases reinforcement, weight can be reduced and there is an advantage which can raise the withstand voltage property between a interphase and opposite touch-down. Moreover, although the example which it prepared each in one right-and-left edge of the stator coil 3 explained the binding-head ring 3 in the above-mentioned example, as shown in drawing 5, only right-hand side may be made into two pieces, cleat 8A may be bent in pars intermedia, and you may weld to each binding-head ring. At this time, since immobilization of cleat 8A becomes firm, there is an advantage to which immobilization of the cable splicing section 16 becomes still firmer. Furthermore, the binding-head ring 40 shown by drawing 4 may be constituted from two, the height and C form part, and may be lightweight-ized.

[0021]

[Effect of the Invention] As mentioned above, according to the 1st and 2nd invention, the cable connected to the bracket attached in the stator through a connection at a stator penetrates, and it sets to the main motor for cars with which the cleat which supports a connection was prepared in the interior of a bracket. Fix one side of a cleat to the stator coil which projected from the stator to shaft

orientations, and a side besides a cleat by fixing to a connection Since the connection was fixed to the stator side before attachment of a bracket, and it enabled it to perform attachment and detachment of a bracket, without participating in a connection, exchange of a bracket is easy and the main motor for cars which can prevent damage on the interference section at the time of bracket exchange can be obtained.

[0022] According to the 3rd invention, the cable connected to the bracket attached in the stator through a connection at a stator penetrates. By preparing the heights which fix a connection to a binding-head ring in the main motor for cars with which the binding-head ring which fixes both these stator coils to the stator coil which projected to shaft orientations was inserted from a stator Since the connection was fixed to the stator side before attachment of a bracket, and it enabled it to perform attachment and detachment of a bracket, without participating in a connection, exchange of a bracket is easy and the main motor for cars which can prevent damage on the interference section at the time of bracket exchange can be obtained.

---

[Translation done.]

\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

---

DESCRIPTION OF DRAWINGS

---

[Brief Description of the Drawings]

[Drawing 1] Partial drawing of longitudinal section showing one example of the 1st and the main motor for cars of the 2nd invention.

[Drawing 2] The A-A sectional view of drawing 1 .

[Drawing 3] Partial drawing of longitudinal section showing one example of the main motor for cars of the 3rd invention.

[Drawing 4] The B-B sectional view of drawing 3 .

[Drawing 5] The 1st, partial drawing of longitudinal section showing other examples of the main motor for cars of the 2nd invention.

[Drawing 6] Drawing of longitudinal section showing an example of the conventional main motor for cars.

[Drawing 7] The partial enlarged vertical longitudinal sectional view showing the conventional main motor for cars.

[Drawing 8] The C-C sectional view of drawing 7 .

[Drawing 9] Partial drawing of longitudinal section showing an operation of the conventional main motor for cars.

[Description of Notations]

1 [ -- A stator axis, 5A, 5B / -- A bearing box, 6A 6B / -- A bracket, 7 / -- A cable, 8 / -- A cleat, 9 / -  
- Iron core presser foot. ] -- A stator core, 2 -- A stator coil, 3 -- A binding-head ring, 4

---

[Translation done.]



\* NOTICES \*

JPO and NCIPi are not responsible for any damages caused by the use of this translation.

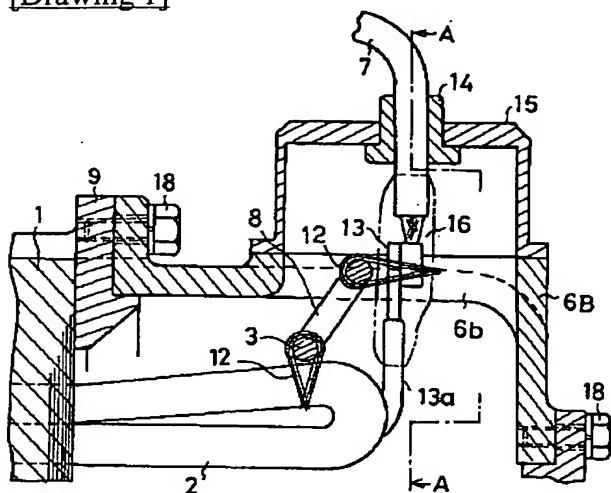
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. \*\*\*\* shows the word which can not be translated.
3. In the drawings, any words are not translated.

---

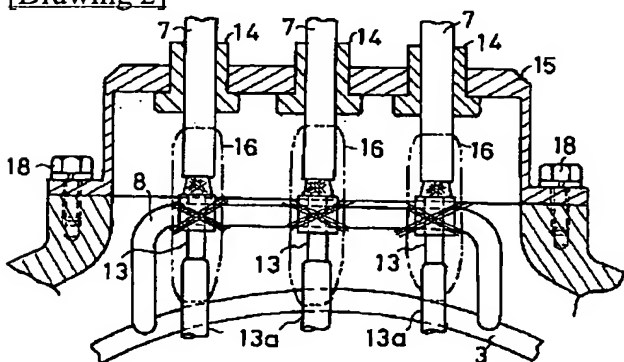
DRAWINGS

---

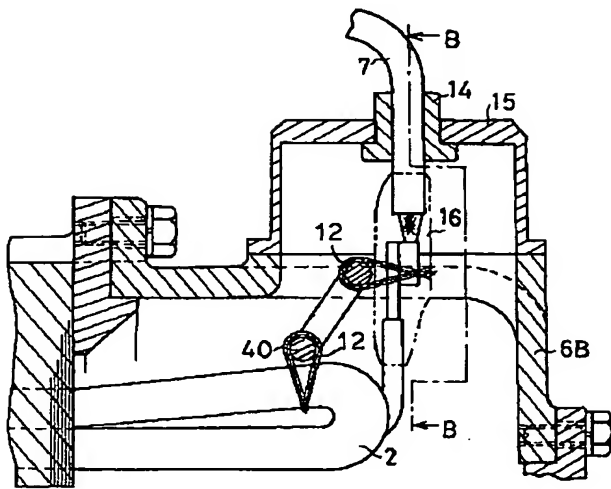
[Drawing 1]



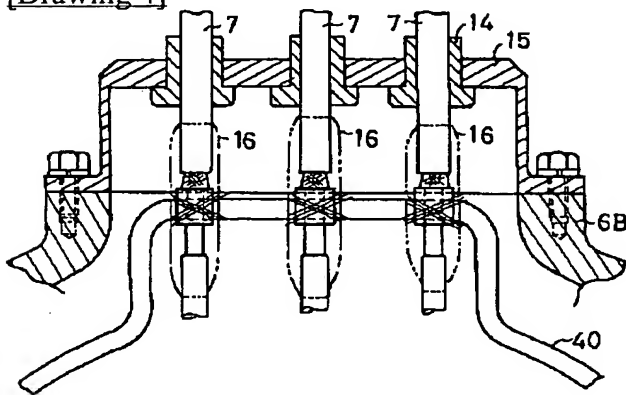
[Drawing 2]



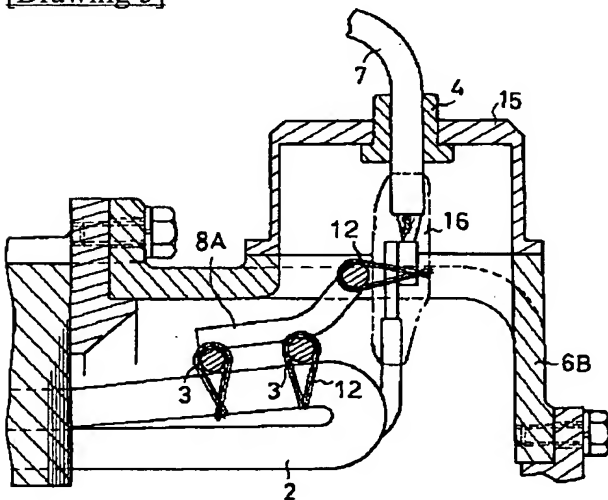
[Drawing 3]



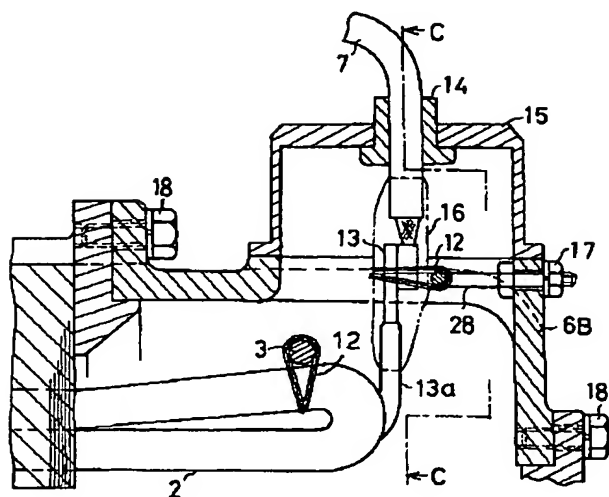
[Drawing 4]



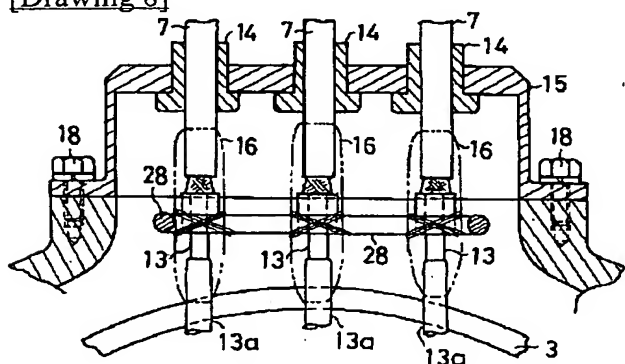
[Drawing 5]



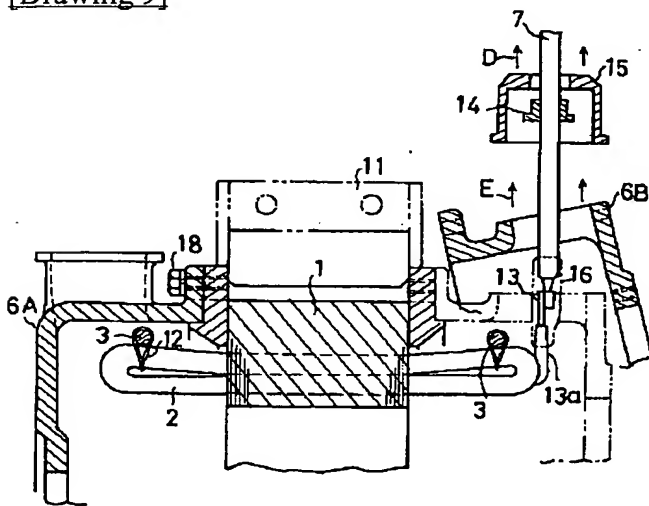
[Drawing 7]



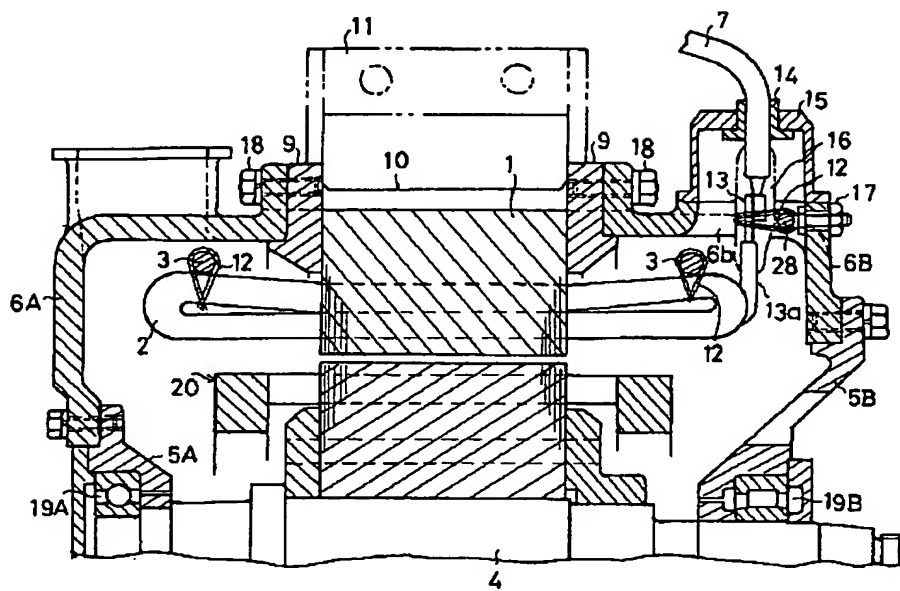
[Drawing 8]



[Drawing 9]



[Drawing 6]



[Translation done.]

## PATENT ABSTRACTS OF JAPAN

(11)Publication number : 05-219674

(43)Date of publication of application : 27.08.1993

(51)Int.Cl.

H02K 3/50

H02K 5/22

(21)Application number : 04-022234

(71)Applicant : TOSHIBA CORP

(22)Date of filing : 07.02.1992

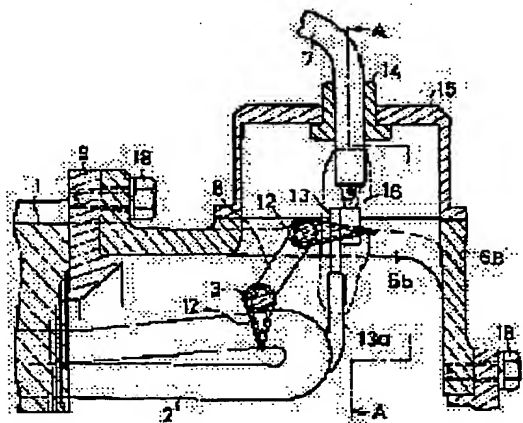
(72)Inventor : KINOSHITA TSUTOMU  
NAGAYAMA TAKASHI

## (54) MAIN MOTOR FOR VEHICLE

## (57)Abstract

**PURPOSE:** To facilitate replacement of a bracket and to prevent damage to a lead at the time of replacing the bracket by fixing one side of a cleat to a stator coil axially protruding from a stator and fixing the other side of the cleat to a connector.

**CONSTITUTION:** Both ends of a cleat 8 made of a soft steel rod formed in an inverted U shape are previously welded to a bind ring 3 inserted to the outer periphery of a stator coil 2. Then, the cleat 8 is fixed to an upper end of the coil 2 by a glass tape 12 so disposed inside a cable connector 16 on a lower part of a suction hole 6b formed on a bracket 6B. An upper part of the cleat 8 is fixed to a connector 16 by a glass tape 12. Thus, a bracket 6B can be solely replaced without removing the cleat 8 from the bracket 6B, and a force to be applied to a lead plate 13 can be supported by the cleat 8. Accordingly, deformation of a base of the plate 13 and a crack of a cover 13a can be prevented.



## LEGAL STATUS

[Date of request for examination] 12.01.1998

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number] 3332402

[Date of registration] 26.07.2002

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

Copyright (C); 1998,2003 Japan Patent Office

①

(19)日本国特許庁 (J P)

(12) 公 開 特 許 公 報 (A)

(11)特許出願公開番号

特開平5-219674

(43)公開日 平成 5 年(1993) 8 月 27 日

(51)IntCl.<sup>5</sup>

H 0 2 K 3/50  
5/22

識別記号

庁内整理番号

A 7346-5H  
7254-5H

F I

技術表示箇所

審査請求 未請求 請求項の数 3 (全 6 頁)

(21)出願番号 特願平4-22234

(22)出願日 平成 4 年(1992) 2 月 7 日

(71)出願人 000003078

株式会社東芝

神奈川県川崎市幸区堀川町72番地

(72)発明者 木下 力

東京都府中市東芝町 1 番地 株式会社東芝  
府中工場内

(72)発明者 永山 孝

東京都府中市東芝町 1 番地 株式会社東芝  
府中工場内

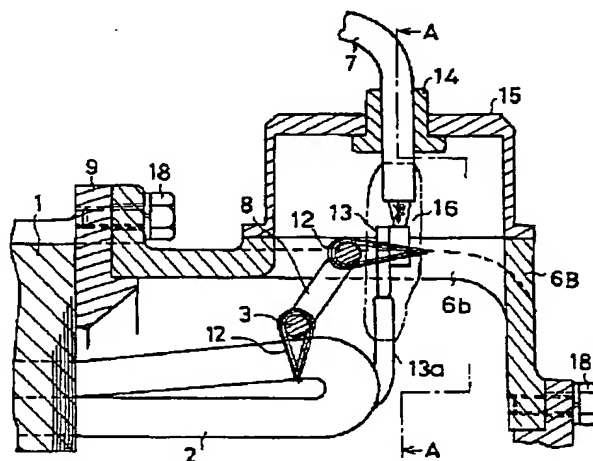
(74)代理人 弁理士 猪股 祥晃

(54)【発明の名称】 車両用主電動機

(57)【要約】

【目的】ブラケットの交換が容易で、ブラケット交換時の口出し部の損傷を防ぐことのできる車両用主電動機を得ること。

【構成】クリート8の下端を固定子コイル2の突出部に縛りひも12で固定し、クリート8の上端は、ケーブル7と口出し板13の接続部16に固定する。



## 【特許請求の範囲】

【請求項1】 固定子に取り付けられたブラケットに、接続部を介して前記固定子に接続されるケーブルが貫通し、前記接続部を支持するクリートが前記ブラケットの内部に設けられた車両用主電動機において、前記クリートの片側を前記固定子から軸方向に突き出た固定子コイルに固定し、前記クリートの他側を前記接続部に固定したことを特徴とする車両用主電動機。

【請求項2】 クリートを強化プラスチック材としたことを特徴とする請求項1記載の車両用主電動機。

【請求項3】 固定子に取り付けられたブラケットに、接続部を介して前記固定子に接続されるケーブルが貫通し、前記固定子から軸方向に突き出た固定子コイルにこの固定子コイル相互を固定するバインドリングが挿着された車両用主電動機において、前記バインドリングに前記接続部を固定する凸部を設けたことを特徴とする車両用主電動機。

## 【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は、車両用主電動機に関する。

【0002】

【従来の技術】周知のように、高速化の一途をたどる鉄道では、高速化のために車両の軽量化が進められ、その一環として車両用主電動機の軽量化が要請されている。この車両用主電動機の軽量化を図るために、回転数の増加や、冷却の向上による鉄心及びコイルの小形化と、構造部分の形状の変更や材料の変更、例えば、アルミニウム材の採用などが進められている。

【0003】図6は、従来の車両用主電動機の一例を示す断面図、図7は図6の右側上部の部分拡大図、図8は図7のC-C断面図である。図6、図7および図8において、上端が図示しない車体の下部に固定された二点鎖線で示す支持金具11には、図示しない台車が支持され、支持金具11の下端には、図6の図示しない側面図では環状をなす一对の鉄心押え9と当て板10がそれぞれ溶接されている。

【0004】このうち、一对の鉄心押え9の内側には、積層された固定子鉄心1があらかじめ挿入されて締め付けられ、上面が当て板10に溶接されている。固定子鉄心1の内周の溝に挿入された固定子コイル2の両端部外周には、軟鋼の丸棒で環状に形成されポリミドテープが巻き付けられた後、更にガラステープが巻き付けられたバインドリング3が嵌合され、このバインドリング3と固定子コイル2の両端部とは、ガラステープの縛りひも12で緊縛され、これらのバインドリング3及び固定子コイル2と固定子鉄心1は、エポキシ樹脂で真空含浸されている。

【0005】左側の鉄心押え9の外側面には、図6の断面図では逆L字形で、この図6の図示しない側面図では

環状をなすアルミニウム合金鋳物製のブラケット6Aの外周側面がボルト18で固定され、右側の鉄心押え9の外側面にも、同じく図示しない側面図では環状をなすアルミニウム合金鋳物製のブラケット6Bの外周側面がボルト18で固定されている。このうち、ブラケット6Aには、環状の中心に形成された貫通穴に同じく環状の軸受箱5Aがボルトで固定され、同じくブラケット6Bには、環状の中心に形成された貫通穴に環状の軸受箱5Bがボルトで固定されている。軸受箱5Aには外側から王軸受19Aが、軸受箱5Bにはころ軸受19Bがそれぞれ挿入され、これらの王軸受5A、ころ軸受5Bには回転軸4が挿入され、この回転軸4には、あらかじめかご形回転子20が挿入・固定されている。

【0006】一方、ブラケット6Bの上端には、固定子コイル2に電力を供給するケーブル7が引き込まれる引込穴6bが形成され、この引込穴6bの上端面には、断面逆U字状のカバー15が図8で示すようにボルト18で取り付けられている。このカバー15の上面には、ケーブル7が貫通する貫通穴が図8で示すように三相分設けられ、これらの貫通穴にはケーブル7が貫通し、このケーブル7は、略凸字状のゴムブッシュ14でカバー15に固定されている。ケーブル7の下端には、このケーブル7の芯線に圧縮端子が固定され、この圧縮端子は、固定子コイル2の右端から上方に突き出て基部が樹脂13aで被覆された口出し板13の上端の側面に重ねられ、ろう付されている。これらのケーブル7と口出し板13のろう付部の外周には、ガラステープが巻き付けられ、このガラステープの外周には、更に絶縁ワニスが塗布されて、二点鎖線で示すケーブル接続部16を形成している。

【0007】ブラケット6Bの上端部には、図6の図示しない平面図では逆コ字状に折り曲げられた軟鋼丸棒製のクリート28が、両端をブラケット6Bの上端外側から軸方向に突き出しナット17で固定して設けられ、このクリート28とケーブル接続部16は、ガラステープの縛りひも12で巻き付けられた後、絶縁ワニスが塗布されて互いに固定されている。

【0008】このように構成された車両用主電動機においては、回転子20の荷重を、支持金具11に支持された固定子鉄心1によって、ブラケット6A、6Bを介して支えることで、固定子鉄心1を構造部材と兼用するとともに、ブラケット6A、6Bをアルミニウム合金とすることで軽量化が図られている。このブラケット6A、6Bの軽量化で、それまで使われていた鉄製のブラケットを使った出力300kW、重量420kgの車両用主電動機では、約5%の軽量化が図られている。

【0009】一方、この車両用主電動機が搭載された車両が線路を走行するときには、線路の小石が巻き上げられてブラケット6A、6Bに叩きつけられることがあ。そして、車両の速度が200km/時以上になると、ブラケット6A、6Bに叩きつけられた小石で微小な亀裂

が発生するおそれあることが走行試験の結果で報告されている。すると、そのときにはブラケット6Bを取り換えるために、クリート28をブラケット6Bに固定しているナット17と、図9に示すようにカバー15を固定しているボルト18を外して、図9に示すように、ケーブル接続部16を分解することなく、ケーブル7からカバー15とブラケット6Bを矢印D、Eに示すように上方に引き抜き、新品のブラケット6Bを挿入して交換する。

【0010】

【発明が解決しようとする課題】ところが、このように構成された車両用主電動機においては、図10に示すようにカバー15をブッシュ14とともに外すときに、図8で示すように曲げられていたケーブル7が伸ばされたり、カバー15やブラケット6Bの接触で動いて、口出し板13に力がかかる。すると、この口出し板13の基部に被覆された樹脂13aにひびが発生し、車両の走行と停車による温度変化で表面に結露した水分で、クリート28を介してブラケット6Bへ地絡するおそれがある。さらに、ブラケット6Bを取り換えて、クリート28を固定した後に、ガラステープによるクリート28と接続部16との緊縛作業は、ブラケット6Bの引込穴6bに指を入れて行なわなければならないので、やりにくく、時間がかかる。

【0011】そこで、第1、第2及び第3の発明の目的は、ブラケットの交換が容易で、ブラケット交換時の口出し部の損傷を防ぐことのできる車両用主電動機を得ることである。

【0012】

【課題を解決するための手段】第1の発明は、固定子に取り付けられたブラケットに、接続部を介して固定子に接続されるケーブルが貫通し、接続部を支持するクリートがブラケットの内部に設けられた車両用主電動機において、クリートの片側を固定子から軸方向に突き出た固定子コイルに固定し、クリートの他側を接続部に固定したことを特徴とする。

【0013】第2の発明は、固定子に取り付けられたブラケットに、接続部を介して固定子に接続されるケーブルが貫通し、接続部を支持するクリートがブラケットの内部に設けられた車両用主電動機において、強化プラスチック材のクリートの片側を固定子から軸方向に突き出た固定子コイルに固定し、クリートの他側を接続部に固定したことを特徴とする。

【0014】第3の発明は、固定子に取り付けられたブラケットに、接続部を介して固定子に接続されるケーブルが貫通し、固定子から軸方向に突き出た固定子コイルにこの固定子コイル相互を固定するバインドリングが挿着された車両用主電動機において、バインドリングに接続部を固定する凸部を設けたことを特徴とする。

【0015】

【作用】接続部は、ブラケットの取付前の固定子側に固定され、ブラケットは、接続部に関与することなく着脱

されることとなる。

【0016】

【実施例】以下、第1及び第2の発明の車両用主電動機の一実施例を図面を参照して説明する。但し、図7、図8及び図9と同一部分には、同一符号を付して説明を省く。図1は、本発明の車両用主電動機の部分詳細図で従来の図8に対応する断面図、図2は、図1のA-A断面図で同じく従来の図9に対応する断面図で、従来とは、クリート8の取付位置が異なる。

10 【0017】図1及び図2において、固定子コイル2の外周に挿入されたバインドリング3には、図2に示すように、逆U字状に形成された軟鋼棒製のクリート8の両端があらかじめ溶接され、このクリート8がブラケット6Bの上部に形成された引込穴6bの下部で、且つ、ケーブル接続部16の内側に位置するようにして、ガラステープ12により従来と同様に固定子コイル2の上部の端部に固定されている。また、クリート8の上部は、従来と同様に、ガラステープ12でケーブル接続部16に固定されている。

20 【0018】このように構成された車両用主電動機においては、叩きつけられた線路の小石でひびが発生したブラケット6Bを取り換えるときには、従来の図8で示すクリート28のようにブラケット6Bからクリート8を取り外すことなく、ブラケット6Bを単独で交換することができる。しかも、ケーブル接続部16がクリート8で固定された状態ででき、口出し板13にかかる力をクリート8で支えることができるので、口出し板13の基部の変形を防ぎ、被覆13aのひびの発生を防ぐことができる。

30 【0019】また、クリート8とケーブル接続部16を分解する必要がなく、ブラケット6Bの交換時のケーブル接続部16とクリート8とのワニス処理されたガラステープ12の巻きもどし及び巻き付けとワニス塗布が要らなくなるので、ブラケット6Bの交換に要する時間を短縮することができる。さらに、車両用主電動機の工場における組立時においても、接続部16とクリート8とのガラステープ12による上述した緊縛作業を、ブラケット6Bを取り付ける前にできるので、作業性が向上する。

40 【0020】なお、第1及び第2の発明では、クリート8をバインドリング3に溶接した例で説明したが、図3及び図3のB-B断面図を示す図4のバインドリング40に示すように、部分的に外側に突出させて、ケーブル接続部16を直接固定し第3の発明としてもよい。さらに、バインドリング3やクリート8は、軟鋼棒で製作した例で説明したが、例えば、FRPなどの絶縁物で製作してもよい。この場合には、直径を増やし強度を増やしても、重量を減らすことができ、相間と対接地間の耐電圧特性を上げることができる利点がある。また、上記実施例では、バインドリング3は固定子コイル3の左右端に各1個設けた例で説明したが、図5に示すように右側だけ2個とし、クリート8Aを中間部で折り曲げて各バイ



5

ンドリングに溶接してもよい。このときには、クリート8Aの固定が強固となるので、ケーブル接続部16の固定が更に強固になる利点がある。さらに、図4で示すバインドリング40を、凸状部とC形部分の2本で構成して軽量化してもよい。

#### 【0021】

【発明の効果】以上、第1及び第2の発明によれば、固定子に取り付けられたブラケットに、接続部を介して固定子に接続されるケーブルが貫通し、接続部を支持するクリートがブラケットの内部に設けられた車両用主電動機において、クリートの片側を固定子から軸方向に突き出した固定子コイルに固定し、クリートの他側を接続部に固定することで、接続部をブラケットの取付前の固定子側に固定し、ブラケットの着脱を接続部に関与することなく行えるようにしたので、ブラケットの交換が容易で、ブラケット交換時の口出し部の損傷を防ぐことのできる車両用主電動機を得ることができる。

【0022】第3の発明によれば、固定子に取り付けられたブラケットに、接続部を介して固定子に接続されるケーブルが貫通し、固定子から軸方向に突き出した固定子コイルにこの固定子コイル相互を固定するバインドリングが挿着された車両用主電動機において、バインドリングに接続部を固定する凸部を設けることで、接続部をブラケットの取付前の固定子側に固定し、ブラケットの着

6

脱を接続部に関与することなく行えるようにしたので、ブラケットの交換が容易で、ブラケット交換時の口出し部の損傷を防ぐことのできる車両用主電動機を得ることができる。

#### 【図面の簡単な説明】

【図1】第1及び第2の発明の車両用主電動機の一実施例を示す部分縦断面図。

【図2】図1のA-A断面図。

【図3】第3の発明の車両用主電動機の一実施例を示す部分縦断面図。

【図4】図3のB-B断面図。

【図5】第1、第2の発明の車両用主電動機の実施例を示す部分縦断面図。

【図6】従来の車両用主電動機の一例を示す縦断面図。

【図7】従来の車両用主電動機を示す部分拡大縦断面図。

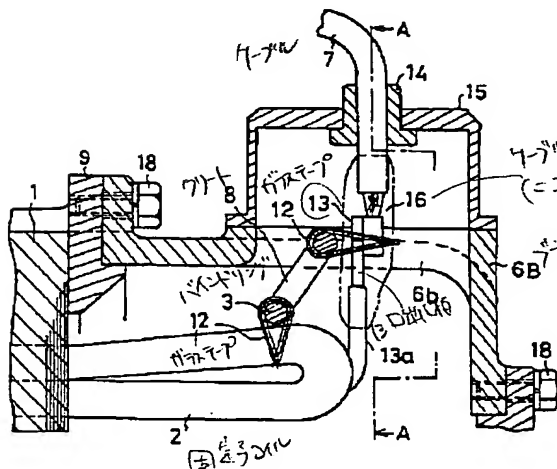
【図8】図7のC-C断面図。

【図9】従来の車両用主電動機の作用を示す部分縦断面図。

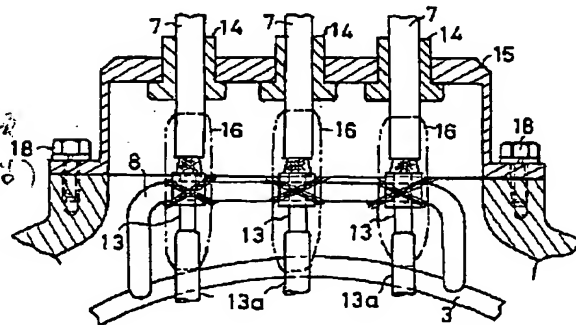
#### 【符号の説明】

1…固定子鉄心、2…固定子コイル、3…バインドリング、4…固定子軸、5A、5B…軸受箱、6A、6B…ブラケット、7…ケーブル、8…クリート、9…鉄心押え。

【図1】



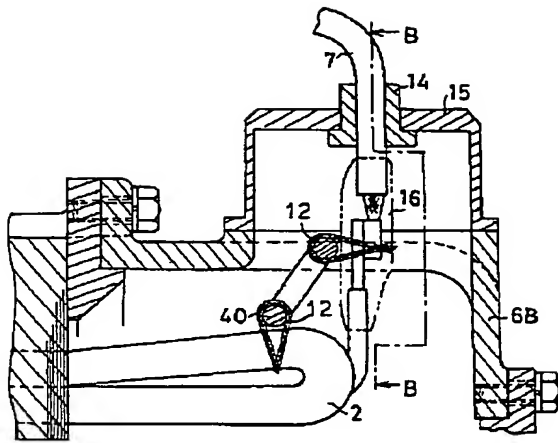
【図2】



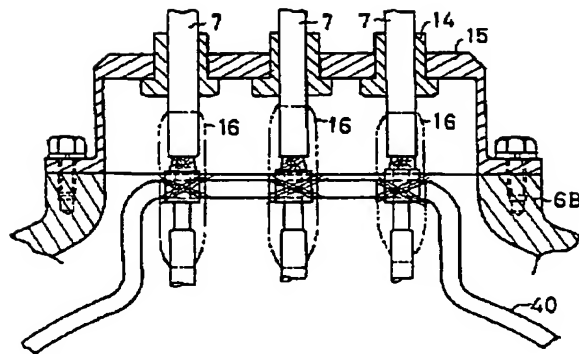
④ 可換部  
無し。

( #1, #2 取外して ケーブル / モーター  
接続し直す )

【図 3】

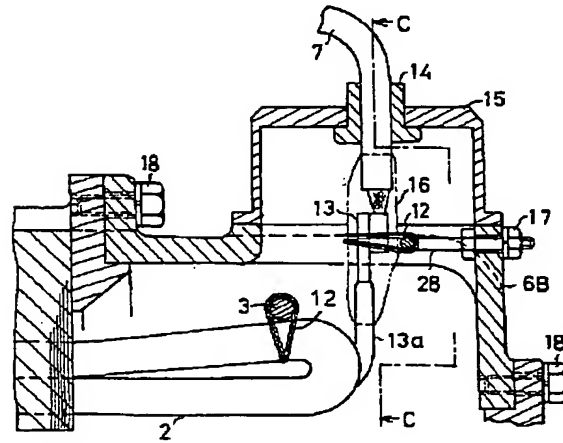
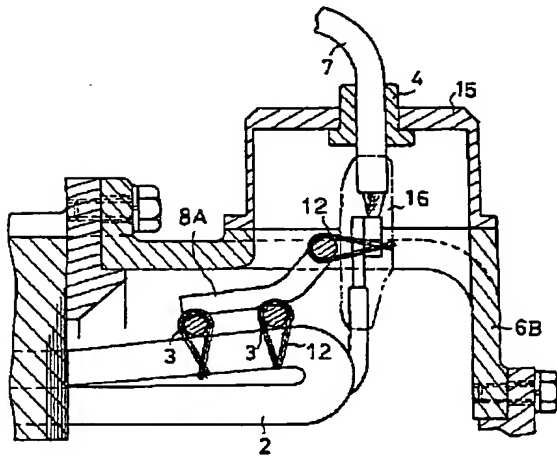


【図 4】



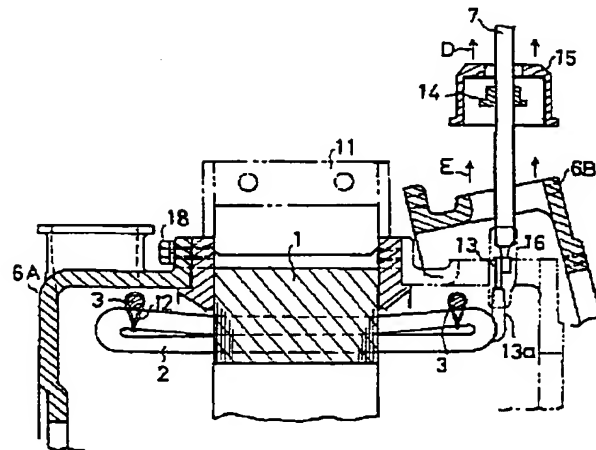
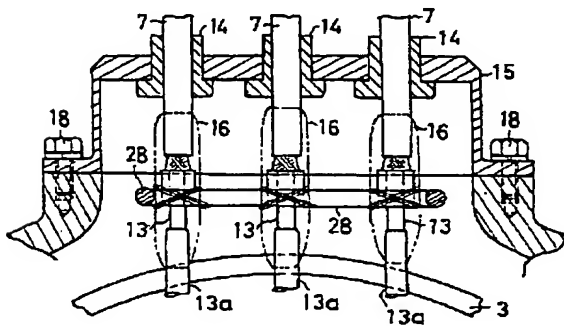
【図 7】

【図 5】

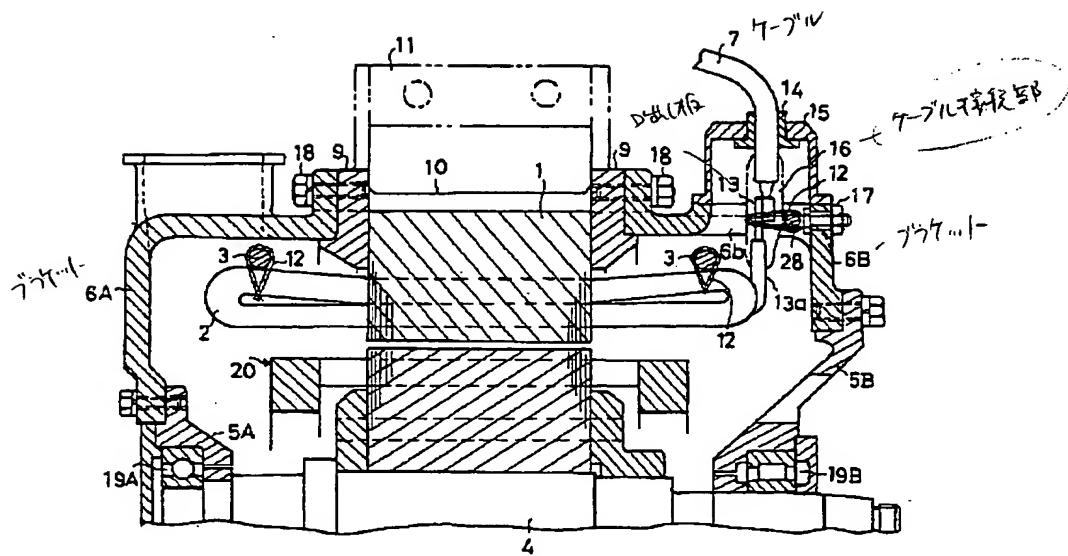


【図 9】

【図 8】



【図6】



**This Page is Inserted by IFW Indexing and Scanning  
Operations and is not part of the Official Record**

**BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: \_\_\_\_\_

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.**